

PM SHRI KENDRIYA VIDYALAYA SITAPUR (FIRST SHIFT)

Unit Test – 1

Class – XI

Subject – Physics

Time – 90 minutes

M.M. – 40

Section – A (1 Mark Each)

Q.1) Base unit of electric current is -

- (a) Candela (b) Volt (c) Ampere (d) Ohm

Q.2) One angstrom is equal to -

- (a) 10^{-6} m (b) 10^{-8} m (c) 10^{-10} m (d) 10^{-12} m

Q.3) In the following which is dimensionless physical quantity -

- (a) Speed (b) Work (c) Acceleration (d) Relative density

Q.4) The dimensional formula of Boltzmann constant is -

- (a) $[ML^2T^{-1}K^{-1}]$ (b) $[ML^2T^{-2}K^{-1}]$ (c) $[ML^2T^{-2}K^{-2}]$ (d) $[ML^2T^{-2}K^{-3}]$

Q.5) A body travels from A to B at 40 m/s and from B to A at 60 m/s . The average velocity of body for whole journey will be -

- (a) 50 m/s (b) 48 m/s (c) 100 m/s (d) 0 m/s

Q.6) A jet plane starts from rest with an acceleration of 3 ms^{-2} and makes a run for 35 s before taking off . The velocity of the jet at take off will be -

- (a) 105 m/s (b) 95 m/s (c) 75 m/s (d) 50 m/s

Q.7) The slope of velocity -time graph represents -

- (a) Speed (b) Distance (c) Displacement (d) Acceleration

Q.8) The displacement (in metre) of a particle moving along x-axis is given by $x = 18t + 5t^2$. The instantaneous velocity at $t = 2$ s is -

- (a) 30 m/s (b) 38 m/s (c) 40 m/s (d) 48 m/s

Q.9) Which of the following is a dimensional constant ?

- (a) Gravitational constant (b) Poisson ratio (c) Relative density (d) Refractive index

Q.10) A displacement vector is a -

- | (a) Scalar
direction | (b) Change in position | (c) Velocity | (d) distance without
direction |
|--------------------------|--------------------------|--------------------------|-----------------------------------|
| ☐ | ☐ | ☐ | ☐ |

Q.11) Which of the following is constant in a projectile motion ?

- (a) Horizontal component of velocity (b) Vertical component of velocity (c) Velocity of projection (d) All of these

Q.12) Two projectiles are projected with the same velocity . If one is projected at an angle of 30° and the other at 60° to the horizontal, then the ratio of maximum height reached is -

- (a) 3 : 1 (b) 1 : 3 (c) 1 : 2 (d) 2 : 1

Q.13) At the uppermost point of a projectile motion, its velocity and acceleration are at an angle of -

- (a) 0° (b) 45° (c) 90° (d) 180°

Q.14) The relation between linear velocity and angular velocity is -

(a) $v = \omega/r$

(b) $v = r/\omega$

(c) $v = r \omega$

(d) $v = r^2\omega$

Assertion – Reason Type Questions

- (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of Assertion (A).
- (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of Assertion (A).
- (c) Assertion (A) is true but Reason (R) is false.
- (d) Both Assertion (A) and Reason (R) are false.

Q.15) **Assertion (A)** : The speedometer of an automobile measures the average speed of the automobile.

Reason (R) : Average velocity is equal to total distance divided by total time taken.

Q.16) **Assertion (A)** : In Javelin throw, the athlete throws the projectile at an angle of 45° for maximum range.

Reason (R) : The maximum range does not depend upon angle of projection.

Section – B (2 Marks Each)

Q.17) The Vander Wall's equation for a gas is $(P + a/V^2)(V - b) = RT$. Determine the dimensions of a & b .

Q.18) A body covers 10 m in 2nd second and 25 m in 5th second. If the motion is uniformly accelerated, how far will it go in 7th second ?

Section – C (3 Marks Each)

Q.19) A planet moves around the sun in nearly circular orbit. Its period of revolution T depends upon radius r of orbit, mass M of the sun and the gravitational constant G . Deduce the expression for T by the method of dimensions. (Take $K = 2\pi$)

Q.20) Two vectors **A** and **B** are inclined to each other at an angle θ . Using parallelogram law of vector addition, find the magnitude and direction of their resultant.

Section – D (5 Marks Each)

Q.21) Using graphical method derive the following:

(i) First equation of motion

(ii) Second equation of motion

Q.22) A projectile is projected with velocity u making an angle θ with horizontal direction, find

(i) Time of flight

(ii) Maximum height

(iii) Horizontal range

(iv) Show that there are two angles of projection for which the horizontal range is same for a projectile.

Section – E (4 Mark)

Case Study (Significant Figures)

Every measurement involves errors. Thus, the result of measurement should be reported in a way that indicates the precision of measurement. Normally, the reported result of measurement is a number that includes all digits in the number that are known reliably plus the first digit that is uncertain. The reliable digits plus the first uncertain digit are known as significant digits or significant figures.

Q.23) Read the above paragraph carefully and answer the following questions.

- a) The number of significant figures in 4.23050 m.
- b) The number of significant figures in 0.000256 m.
- c) 5.74 g of a substance occupies 1.2 cm^3 . Express its density by keeping the significant figures in view.